Engineering Physics Curriculum Checklist

Title	Course	Cr.	Pre/Co-Requisites	Term	Grade
Chemistry					
General Chemistry for Engineering 1	CHEM 0960	3			
General Chemistry for Engineering 2	CHEM 0970	3	CHEM 0960		
Electrical & Computer Engineering					
Linear Circuits & Systems	ECE 0101	4	PHYS 0175, ENGR 0012 *Math 0280, 0290*		
Digital Circuits & Systems	ECE 0201	4	PHYS 0175, ENGR 0012		
Microelectronic Circuits & Lab	ECE 0102	4	ECE 0101		
Problem Solving in C++	ECE 0301	3	ENGR 0012		
Electrical Circuits Design Lab	ECE 1212	3	ECE 0102, 0402		
Semiconductor Device Theory	ECE 1247	3	ECE 0402 or ENGR 0020		
Applied Fields & Waves	ECE 1266	3	PHYS 1351, ECE 0301		
Signals Systems & Probabilities	ECE 0402	3	MATH 0280, 0290		
Junior Design Fundamentals	ECE 1895	3	ECE 0102, ECE 0202, ECE 0302, ECE 0402		
General Engineering					
Introduction to Engineering Analysis	ENGR 0011	3			
Engineering Computing	ENGR 0012	3	ENGR 0011		
Materials Structures & Properties	ENGR 0022	3	PHYS 0175, MATH 0230		
Statics & Mechanics of Materials 1	ENGR 0135	3	MATH 0230, PHYS 0174		
Humanities & Social Sciences					
Humanities Elective*		3			
Social Sciences Elective*		3			
Humanities/Social Sciences Elective*		3			
Humanities/Social Sciences Elective*		3			
Humanities/Social Sciences Elective*		3			
Humanities/Social Sciences Elective * ‡		3			
Mathematics					
Analytical Geometry & Calculus 1	MATH 0220	4			
Analytical Geometry & Calculus 2	MATH 0230	4	MATH 0220		
Analytical Geometry & Calculus 3	MATH 0240	4	MATH 0230		
Matrices & Linear Algebra	MATH 0280	3	MATH 0220		
Differential Equations	MATH 0290	3	MATH 0230		

Mechanical Engineering					
Introduction Thermodynamics	MEMS 0051	3	PHYS 0175, CHEM 0960		
Structures of Crystals	MEMS 1053	3	ENGR 0022		
Phase Equilibria	MEMS 1059	3	ENGR 0022, MEMS 0051		
Physics					
Physics for Science & Engineering 1	PHYS 0174	4	*MATH 0220*		
Physics for Science & Engineering 2	PHYS 0175	4	PHYS 0174, *MATH 0230*		
Lab Physics for Science & Engineering	PHYS 0219	2	*PHYS 0175*		
Principles of Modern Physics 1	PHYS 0477	4	PHYS 0175, *MATH 0240*		
Principles of Modern Physics 2	PHYS 0481	3	PHYS 0477		
Upper-Level Physics (Recommended: Intermediate Electricity & Magnetism)	PHYS (1351)	3	PHYS 0175, MATH 0240, *MATH 0290*		
Upper-Level Physics	PHYS	3			
Upper-Level Physics	PHYS	3			
Program Specific					
Program Elective (Recommended: Partial Differential Equations [MATH 1470])	(MATH 1470)	3	MATH 0240, MATH 0290		
Program Elective		3			
Senior Design					
Senior Design 1[+]		3			
Senior Design 2[++]		3			

Upper-Level Physics: Physics courses with course numbers > 1000

[+] A senior design course offered by one of the other SSOE engineering programs is required. Alternatively, may be ENGR 1050 Product Realization, or with preapproval, a senior design project arranged with a faculty mentor and taken as ENGSCI 1801.
[++] A semester-long research experience under the supervision of a faculty advisor at Pitt, not necessarily within the Swanson School of Engineering. Note that this requirement may also be fulfilled by participation in an undergraduate research program like the MCSI URP or the SURI during the summer semester.

[‡]A University designated writing intensive course

*All Humanities and Social Science electives must be from the SSOE approved list. Two courses need to be in single area (see SSOE guidelines).

Italicized courses indicate co-requisites; courses must be taken prior to or concurrently.

Engineering Physics Curriculum Program Electives

Upper-level physics possible choices (must meet prerequisite requirements) include the following:

PHYS 1331: Mechanics
PHYS 1341: Thermodynamics. & Statistical Mechanics
PHYS 1351: Intermediate Electricity & Magnetism (Same as ECE 1259)
PHYS 1361: Wave Motion and Optics (PHYS 0219)
PHYS 1370: Introduction to Quantum Mechanics 1 (Corequisite: PHYS 1331 and 1351)
PHYS 1371: Introduction to Quantum Mechanics 2 (Prerequisite: PHYS 1370)
PHYS 1372: Electromagnetic Theory (Corequisite: PHYS 1331 and 1351)
PHYS 1374: Solid State Physics (Prerequisite: PHYS 0477)
PHYS 1376: Introduction to Biological Physics (Math 235 or Statistics 1000)
PHYS 1378: Introduction to Nuclear & Particle Physics 1 (Prerequisite: PHYS 1370)

There are two program electives in the Engineering Physics curriculum. It is recommended that students planning to pursue graduate studies in physics take the standard quantum mechanics sequence in the Physics department:

PHYS 1370: Introduction to Quantum Mechanics 1
PHYS 1371: Introduction to Quantum Mechanics 2

Students can also satisfy the program elective requirement by choosing a two-course sequence that creates in-depth exposure to a topic area. Example sequences of courses include the following:

ECE 1250: Introduction to Nanotechnology & Nanoengineering
ECE 1251: Fabrication & Design in Nanotechnology

Other Elective Options Include:

Electrical & Computer Engineering
ECE 1232: Introduction to Lasers & Optical Electronics
ECE 1238: Digital Electronics

Mechanical Engineering
MEMS 1010: Experimental Methods in Materials Science & Engineering
MEMS 1048: Analysis & Characteristics at the Nanoscale
MEMS 1049: Mechatronics
MEMS 1057: Micro/Nano Manufacturing
MEMS 1082: Electromechanical Sensors & Actuators
MEMS 1111: Materials for Energy Generation & Storage